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(57) Abstract :

Mathematically Enhanced AI Framework for Electric Vehicle Air Pollution Control and Emission Reduction Using Electro-Chemical Reactor Systems is the proposed invention. The proposed invention discloses a mathematically enhanced artificial intelligence framework for air pollution control and emission reduction in electric vehicle ecosystems using electro-chemical reactor systems. The framework integrates rigorous mathematical modeling of electro-chemical reaction kinetics, mass transport, and energy balance with AI-driven predictive analytics to enable intelligent and adaptive emission control. Real-time data from reactor units, electric vehicle subsystems, and environmental sensors are analyzed to predict pollutant behavior and optimize reactor operating parameters. The system employs closed-loop control and continuous learning to ensure efficient pollutant conversion, reduced energy consumption, and improved operational reliability. By combining mathematical intelligence with AI-based optimization, the invention supports sustainable electric mobility, regulatory compliance, and advanced environmental management in electric vehicle infrastructures.

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